Common Tasks: Math

The Rhode Island Skills Commission

Explanation and Considerations for Use

The Rhode Island Skills Commission has developed mathematics common tasks as part of the Certificate of Initial Mastery (CIM) process. These common tasks have been developed by task specialists and are aligned to appropriate standards. For information about how these common tasks were developed, see "Sample Process for Writing Tasks". For more detailed information about administering common tasks in classrooms, see "Guidelines for Administering Common Tasks".

Math common tasks can be used by districts in partial fulfillment of a student's graduation portfolio requirements. For more information, contact the Rhode Island Skills Commission at (401) 222-8417.

Mathematics
On Demand Task #2B
Mason's Mission: Math Meets Mulch
2004-2005

Please PRINT the information in the spaces below. When you are done, please use the sticker provided and attach this page to the cover page.

First Name																
Last Name																

Class Year				

School																
Teacher																

	Month		**Day**		**Year**	
Today's Date			/			/		

Standards and Indicators Assessed

M2 Geometry and Measurement Concepts

M2a The student models situations geometrically to form and solve problems.

M2e The student knows and uses formulas for volume.

M2k The student works with geometric measures of volume.

M2m The student understands unit conversions and dimensional analysis.

M5 Problem Solving and Mathematical Reasoning

M5c The student provides closure to the solution process through summary statements and

   general conclusions.

Standards and Indicators	**Grade Span Expectations**
M2. Geometry and Measurement Concepts	**M(G&M)-10-6: Geometry and Measurement**
M2a ♦ The student models situations geometrically to form and solve problems.	♦ Solves problems involving volume of prisms, cylinders, and cones using appropriate units of measure.
M2e ♦ The student knows and uses formulas for volume.	**M(G&M)-10-7: Geometry and Measurement**
M2k ♦ The student works with geometric measures of volume.	♦ Uses units of measures appropriately and makes conversions within or across systems.
M2m ♦ The student understands unit conversions and dimensional analysis.	
M5. Problem Solving and Mathematical Reasoning	
M5c ♦ The student provides closure to the solution process through summary statements and general conclusions.	

Student and Teacher Directions

Prerequisites

In order to complete this task, students should be able to:

- Calculate the volume of a rectangular solid, a cylinder, and a cone.
- Convert linear measurements to cubic feet and cubic yards.
- Convert circumference to radius.
- Draw and label geometric diagrams.

Teachers

- Prior to giving the task, students should fill out the header sheet. Teachers should review the Standards, the Student and Teacher Directions, the Rubric, and the Prompt for clarity with the students.
- This task should take one 90-minute or two 45-minute "on-task" periods to complete. For some classes, the prompt may be read to the students before they begin. Students should be allowed about 10 additional minutes if needed. If 90-minute block is not available, you are authorized to copy those pages of the prompt to be completed on the first day and attach to the booklet before student completes the task on the second day. Only the booklet name and number should appear on the copies or additional pages, if they contain student work.
- Use of mathematical tools including calculators, graphing calculators, textbooks and notes is permitted.
- Students must work alone on this task.
- Modifications according to Individual Educational Plans, 504 Plans, and/or Personal Literacy Plans (PLPs) need to be in place.

Students

- Read through the problem and the rubric to determine what is being asked of you before you attempt to answer any part. Reread as needed.
- Remember to supply supporting evidence in each part.
- Make sure you answer each question of prompt. You must show evidence that the work reflects serious attention to the details of the task.
- Include in your task booklet any additional pages that include work. Only use the **booklet name** and **number** to identify your additional pages.
- You must work alone on this task.

If you use a calculator or graphing calculator, you must thoroughly explain your reasoning and justify your solutions through calculations and/or written commentary. For example: using a calculator to divide 1296 by 48, you should write out 1296 / 48 = 27.

EXPECTATIONS AND STANDARDS	EXCEEDS STANDARD 4	MEETS STANDARD 3	NEARLY MEETS STANDARD 2	BELOW STANDARD 1	LITTLE/NO EVIDENCE 0
Student models situations geometrically to form and solve problems using formulas, working with measures, and using unit conversions. Question 1	Student calculates minimum volume within 0.1 cubic yards. Diagram is clearly labeled and all supporting work is shown. All answers show appropriate labels.	Student calculates volume within 2 cubic yards Diagram may not be clearly labeled. Explanation may lack detail.	Student calculates volume but contains an intrusive error **or** student calculates volume correctly but diagram or explanation is not provided.	Student attempts to calculate volume but has more than one intrusive error. Supporting work is incomplete.	Student makes little or no effort to calculate the volume.
Student calculates volumes of cylinders and converts units. **Question 2**	Student calculates exact number of cubic yards to be ordered. Diagram is clearly labeled and all supporting work is shown. All answers show appropriate labels.	Student calculates number of cubic yards to be ordered within 1 cubic yard. Diagram may not be clearly labeled. All supporting work is shown.	Student calculates number of cubic yards to be ordered but contains errors **or** student calculates volume correctly but diagram or supporting work is incomplete.	Student attempts to calculate number of cubic yards to be ordered but work is incomplete.	Student makes little or no effort to calculate the number of cubic yards to be ordered.
Student calculates volume of a cone and converts units. **Question 3**	Student calculates number of cubic yards received within 0.1 cubic yards. Supporting work is clear and detailed. All answers show appropriate labels.	Student calculates number of cubic yards received within 1 cubic yard. Work is shown, but may contain minor errors.	Student calculates number of cubic yards received but contains an intrusive error **or** student calculates volume correctly but supporting work is incomplete.	Student attempts to calculate number of cubic yards received but work is incomplete	Student makes little or no effort to calculate the number of cubic yards received.
Student explains the results of calculations. **Question 4**	Student has provided an explanation relating the amount of mulch received to both the amount of mulch needed and the amount of mulch ordered. All mathematical evidence is shown with appropriate labels.	Student has provided an explanation relating the amount of mulch received to both the amount of mulch needed **or** the amount of mulch ordered. Some mathematical evidence is shown.	Student has provided an explanation but does not relate the amount of mulch received to either the amount of mulch needed or the amount of mulch ordered. **Or** student has shown mathematical evidence that is unclear and incomplete.	Student attempts to provide an explanation.	Student makes little or no effort to provide an explanation.

Mason's Mission: Math Meets Mulch

Mason is an old bearded farmer who lives on an island down on Old Beach Road. Mason keeps his chickens in an old rectangular barn built in 1904 and his chicken feed in a huge cylindrical silo. The land surrounding Mason's barn is currently only a dirt surface. Recent publicity has made Mason aware of the health problems associated with lead paint. The law states that any building built before 1978 coated with lead paint can contaminate the surrounding dirt. Mason must assume that he has contamination and it can be hazardous to animals as well as humans. Therefore, dirt next to a contaminated building must be covered with some type of material 6 inches deep and extending 10 feet out from the building to be considered safe. Mason's barn is 50 feet by 30 feet. Mason's friends have volunteered to bring as many cubic yards of crushed quahogs (clamshells) as Mason needs to cover the dirt around his barn.

---

1. Compute the minimum volume of clamshells in **cubic yards** needed to cover the dirt surrounding Mason's barn. Be sure to show all your calculations. Sketch and label a diagram to support all your work. All answers need appropriate labels.

2. Mason discovered that he had lead paint problems with his silo also. He decided to protect his contaminated land around his silo and beautify the area with a flower garden. He laid down several inches of rich garden soil he had on his farm and decided to lay down a 4-inch layer of mulch to contain the moisture and to protect against the contamination. The silo is 50 feet in circumference and Mason wants the mulch to extend 6 feet out from it. He has to order the mulch from Magnificent Mulch Makers, who sell mulch only in increments of **whole cubic yards.** Determine the number of **cubic yards** Mason needs to order. Explain in detail how you determine the number of **whole cubic yards** Mason needs to order. Show all your calculations with appropriate labels. Sketch and label a diagram to support all your work.

3. While Mason was feeding his chickens, Magnificent Mulch Makers backed into his driveway and dumped all the mulch there. The shape of the pile was that of a cone. Mason estimated the diameter of the cone to be 10 feet and the pile was about 6 feet high. Mason did not believe that he received all the mulch that he ordered. Calculate the volume of the pile of mulch **in cubic yards**. Show all your calculations. All answers need appropriate labels.

4. Did Mason get all the mulch he ordered? Did Mason receive enough mulch to cover the area around the silo? Justify your response relating the amount of mulch **received** to **both** the amount of mulch **needed** and the amount of mulch **ordered**. Use written mathematical evidence properly labeled to support your answers.

Scorer 1

EXPECTATIONS AND STANDARDS	EXCEEDS STANDARD 4	MEETS STANDARD 3	NEARLY MEETS STANDARD 2	BELOW STANDARD 1	LITTLE/NO EVIDENCE 0
Student models situations geometrically to form and solve problems using formulas, working with measures, and using unit conversions. Question 1	Student calculates minimum volume within 0.1 cubic yards. Diagram is clearly labeled and all supporting work is shown. All answers show appropriate labels.	Student calculates volume within 2 cubic yards Diagram may not be clearly labeled. Explanation may lack detail.	Student calculates volume but contains an intrusive error **or** student calculates volume correctly but diagram or explanation is not provided.	Student attempts to calculate volume but has more than one intrusive error. Supporting work is incomplete.	Student makes little or no effort to calculate the volume.
Student calculates volumes of cylinders and converts units. Question 2	Student calculates exact number of cubic yards to be ordered. Diagram is clearly labeled and all supporting work is shown. All answers show appropriate labels.	Student calculates number of cubic yards to be ordered within 1 cubic yard. Diagram may not be clearly labeled. All supporting work is shown.	Student calculates number of cubic yards to be ordered but contains errors **or** student calculates volume correctly but diagram or supporting work is incomplete.	Student attempts to calculate number of cubic yards to be ordered but work is incomplete.	Student makes little or no effort to calculate the number of cubic yards to be ordered.
Student calculates volume of a cone and converts units. Question 3	Student calculates number of cubic yards received within 0.1 cubic yards. Supporting work is clear and detailed. All answers show appropriate labels.	Student calculates number of cubic yards received within 1 cubic yard. Work is shown, but may contain minor errors.	Student calculates number of cubic yards received but contains an intrusive error **or** student calculates volume correctly but supporting work is incomplete.	Student attempts to calculate number of cubic yards received but work is incomplete.	Student makes little or no effort to calculate the number of cubic yards received.
Student explains the results of calculations. Question 4	Student has provided an explanation relating the amount of mulch received to both the amount of mulch needed and the amount of mulch ordered. All mathematical evidence is shown with appropriate labels.	Student has provided an explanation relating the amount of mulch received to both the amount of mulch needed **or** the amount of mulch ordered. Some mathematical evidence is shown.	Student has provided an explanation but does not relate the amount of mulch received to either the amount of mulch needed or the amount of mulch ordered. **Or** student has shown mathematical evidence that is unclear and incomplete.	Student attempts to provide an explanation.	Student makes little or no effort to provide an explanation.

Comments _____

Score _____ Scorer's Initials _____

EXPECTATIONS AND STANDARDS	EXCEEDS STANDARD 4	MEETS STANDARD 3	NEARLY MEETS STANDARD 2	BELOW STANDARD 1	LITTLE OR NO EVIDENCE 0
Student models situations geometrically to form and solve problems using formulas, working with measures, and using unit conversions. **Question 1**	Student calculates minimum volume within 0.1 cubic yards. Diagram is clearly labeled and all supporting work is shown. All answers show appropriate labels.	Student calculates volume within 2 cubic yards Diagram may not be clearly labeled. Explanation may lack detail.	Student calculates volume but contains an intrusive error **or** student calculates volume correctly but diagram or explanation is not provided.	Student attempts to calculate volume but has more than one intrusive error. Supporting work is incomplete.	Student makes little or no effort to calculate the volume.
Student calculates volumes of cylinders and converts units. **Question 2**	Student calculates exact number of cubic yards to be ordered. Diagram is clearly labeled and all supporting work is shown. All answers show appropriate labels.	Student calculates number of cubic yards to be ordered within 1 cubic yard. Diagram may not be clearly labeled. All supporting work is shown.	Student calculates number of cubic yards to be ordered but contains errors **or** student calculates volume correctly but diagram or supporting work is incomplete.	Student attempts to calculate number of cubic yards to be ordered but work is incomplete.	Student makes little or no effort to calculate the number of cubic yards to be ordered.
Student calculates volume of a cone and converts units. **Question 3**	Student calculates number of cubic yards received within 0.1 cubic yards. Supporting work is clear and detailed. All answers show appropriate labels.	Student calculates number of cubic yards received within 1 cubic yard. Work is shown, but may contain minor errors.	Student calculates number of cubic yards received but contains an intrusive error **or** student calculates volume correctly but supporting work is incomplete.	Student attempts to calculate number of cubic yards received but work is incomplete.	Student makes little or no effort to calculate the number of cubic yards received.
Student explains the results of calculations. **Question 4**	Student has provided an explanation relating the amount of mulch received to both the amount of mulch needed and the amount of mulch ordered. All mathematical evidence is shown with appropriate labels.	Student has provided an explanation relating the amount of mulch received to both the amount of mulch needed **or** the amount of mulch ordered. Some mathematical evidence is shown.	Student has provided an explanation but does not relate the amount of mulch received to either the amount of mulch needed or the amount of mulch ordered. **Or** student has shown mathematical evidence that is unclear and incomplete.	Student attempts to provide an explanation.	Student makes little or no effort to provide an explanation.

Comments _____

Score _____ Scorer's Initials _____

Mathematics
Extended Task #4
Track Meet Scheduling
2004-2005

Please PRINT the information in the spaces below. When you are done, please use the sticker provided and attach this page to the cover page.

First Name																
Last Name																

Class Year				

School																
Teacher																

	Month		Day		Year	
Today's Date		/		/		

Standards and Indicators Assessed

A1c: Applied Learning Problem Solving

The student develops a schedule that:

♦ Is sensible in terms of the goals of the event or activity,

♦ Is logical and achievable,

♦ Takes account of all relevant factors, and

♦ Communicates clearly so that a peer or colleague could use it.

M1i Number and Operations Concepts

♦ The student carries out counting procedures such as those involving permutations and combinations.

M2n: Geometry and Measurement Concepts

♦ The student solves problems involving scale, such as in maps and diagrams.

M4a: Statistics and Probability Concepts

♦ The student organizes and analyzes single-variable data (mean)

M4f: Statistics and Probability Concepts

♦ The student interprets representations of data, compares distributions of data, an critiques conclusions.

M5a: Problem Solving and Mathematical Reasoning

Given a statement of a problem situation, the student:

♦ Extracts pertinent information from the situation as a basis for working on the problem, and

♦ Answers a series of appropriate questions in pursuit of a solution.

Standards and Indicators

Grade Span Expectations

A1c: Applied Learning Problem Solving

The student develops a schedule that:

♦ Is sensible in terms of the goals of the event or activity,

♦ Is logical and achievable,

♦ Takes account of all relevant factors, and

♦ Communicates clearly so that a peer or colleague could use it.

M1i: Number and Operations Concepts

♦ Carries out counting procedures such as those involving arrangements (permutations and combinations).

M2n: Geometry and Measurement Concepts

♦ Solves problems involving scale, such as in maps and diagrams.

M4a: Statistics and Probability Concepts
♦ Organizes and analyzes single-variable data (mean).

M4f: Statistics and Probability Concepts

♦ Interprets representations of data, compares distributions of data, and critiques conclusions.

M5a: Problem Solving and Mathematical Reasoning

Given the statement of a problem situation, the student:

♦ Extracts pertinent information from the situation as a basis for working on the problem, and

♦ answers a series of appropriate questions in pursuit of a solution.

M(DSP)-10-4: Data, Statistics and Probability

♦ Using counting techniques to solve problems in context involving combinations or permutations.

M(G&M)-10-7: Geometry and Measurement

♦ Uses units of measures appropriately and makes conversions within or across systems.

M(DSP)-10-4: Data, Statistics and Probability

♦ Analyzes distributions in univariate data by using measures of central tendency.

Student and Teacher Directions

Prerequisites

In order to complete this task, students should be able to:
- Organize and manipulate data to develop and revise schedule based on given criteria.
- Solve problems involving scale and measure accurately using maps.
- Calculate the mean.

Teachers
- Prior to giving the task, students should fill out the header sheet. Teachers should review the Standards, the Student and Teacher Directions, the Rubric, and the Prompt for clarity with the students.
- This task should be given to students to work on for two full weeks.
- The teacher should conference with each student within a week to make suggestions for revision. Then, the revised task should be submitted on time for scoring.
- Use of mathematical tools including calculators, graphing calculators, textbooks and notes is permitted.
- Students must work alone on this task.
- Modifications according to Individual Educational Plans, 504 Plans and/or Personal Literacy Plans (PLPs) need to be in place.

Students
- Read through the problem and the rubric to determine what is being asked of you before you attempt to answer any part. Reread as needed.
- Remember to supply supporting evidence in each part.
- Make sure you answer each question or prompt. You must show evidence that the work reflects serious attention to the details of the task.
- Include in your task booklet any additional pages that include work. Only use the **booklet name** and **number** to identify your additional pages.
- You must work alone on this task.
- Revision is encouraged after consulting with teacher; then, the task should be submitted on time for scoring.

If you use a calculator or graphing calculator, you must thoroughly explain your reasoning and justify your solutions through calculations and/or written commentary. For example: using a calculator to divide 1296 by 48, you should write out 1296 / 48 = 27.

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0
The student develops a schedule that meets all criteria and clearly communicates the process. **(Question 1)**	Student accurately develops a schedule that meets **all** criteria and is well organized. Explanation is detailed and clear. No errors are present.	Student accurately develops a schedule that is organized and meets **all** criteria, except that minor errors in number of home meets may be present. Explanation may lack detail.	Student develops a schedule that meets **some** criteria but contains an intrusive error. Explanation may lack detail.	Student develops a schedule that contains more than one intrusive error.	Student makes little or no effort to develop a schedule.
The student uses scale provided on map to calculate distances. **(Question 2)**	Student determines the total round trip distance for **each** school within a 10% margin of error. Student work is detailed and clear.	Student determines the total round trip distance for 7 or 8 schools within a 10% margin of error. Student work may lack some detail.	Student determines the total round trip distance for 5 or 6 schools within a 10% margin of error. Student work may lack some detail.	Student attempts to determine the total round trip distance for each school but has **more than 4 errors.**	Student makes little or no effort to determine the total round trip distance for each school.
The student calculates mean. (Question 3)	Student determines the **exact mean** based on the distances determined in 2) above. Student work is detailed and clear.	Student determines the mean, within **one mile**, based on the distances determined in 2) above. Student work may lack some detail.	Student determines the mean, **within ten miles**, based on the distances determined in 2) above **or** student accurately determines the mean but work is not shown.	Student attempts to determine the mean but answer is off by **more than ten miles.**	Student makes little or no effort to determine the mean.
The student develops a revised schedule that meets both old and new criteria and clearly communicates the process. **(Question 4)**	Student accurately revises the schedule so that it meets **all** criteria and is well organized. Explanation is detailed and clear. No errors are present.	Student accurately revises the schedule so that it is organized and meets **all** criteria, except that minor errors in number of home meets may be present. Explanation may lack detail.	Student revises the schedule and lowers the mean but has an intrusive error. Explanation may lack detail.	Student revises the schedule but does not lower the mean or has more than one intrusive error.	Student makes little or no effort to revise the schedule.

71° 50' 71° 40' 71° 30' 71° 20' 71° 10'

42°

Slatersville Woonsocket

Union Village Cumberland Hill

Pascoag Harrisville

Manville Lincoln

Mapleville

MASSACHUSETTS

Lonsdale Valley Falls
Saylesville Central Falls

Esmond Pawtucket

Greenville North Providence

Johnston Providence

East Providence

41° 50'

CONNECTICUT

Scituate Reservoir

Cranston

Barrington

Warren

West Warwick

Anthony Warwick

Coventry

Bristol

East Greenwich

Island Park Tiverton

41° 40'

Narragansett Bay

North Kingstown

Portsmouth

Exeter

Middletown

Hope Valley

Jamestown

41° 30'

West Kingston Kingston

Newport

Peace Dale

Ashaway Wakefield Narragansett

Rhode Island Sound

Bradford Charlestown

Westerly Point Judith

41° 20'

Quonochontaug

Watch Hill

Block Island Sound

ATLANTIC OCEAN

41° 10'

Block Island

0 2 4 6 8 10 mi
0 2 4 6 8 10 12 14 km

©2001, Encyclopædia Britannica, Inc.

Rhode Island Skills Commission©2005. Do not use for commercial purposes.

Track Meet Scheduling

Schools from nine different communities (Bristol, Central Falls, Coventry, Johnston, Lincoln, Middletown, Pawtucket, Warwick and West Warwick) have been assigned to the Superstar Division of the Interscholastic Track League with the following **criteria:**

- Each school must compete in four triangular meets. A triangular meet is three schools competing against each other at the same time.

- Each school must compete against each of the other schools exactly once.

- Each school must have either one or two home meets.

Your Task

1) Design a schedule that meets the above criteria, making sure that you indicate which school is the home team at each meet. Write a detailed explanation of how you developed the schedule.

2) Based upon your schedule, determine the total **round-trip** traveling distance (**in miles**) for **each** of the nine schools using the preceding map and the shortest route possible between each school. Distances should be measured using **only** the roads displayed on the map. Show all of your work.

3) Find the mean of the total distances traveled by the nine schools. The answer should be exact. Show all of your work.

4) Some of the schools feel that their share of the travel cost is excessive compared to the other schools. Revise the schedule so that the mean of the distances traveled is less than the mean you originally calculated, following the same criteria for the schedule. Write a detailed explanation of how you developed the revised schedule. Discuss any considerations you had to keep in mind and any assumptions made that affected your decision-making process. How did you address these issues?

Student Work

Student Work

Student Work

Student Work

Student Work

Scorer 1

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0
The student develops a schedule that meets all criteria and clearly communicates the process. **(Question 1)**	Student accurately develops a schedule that meets **all** criteria and is well organized. Explanation is detailed and clear. No errors are present.	Student accurately develops a schedule that is organized and meets **all** criteria, except that minor errors in number of home meets may be present. Explanation may lack detail.	Student develops a schedule that meets **some** criteria but contains an intrusive error. Explanation may lack detail.	Student develops a schedule that contains more than one intrusive error.	Student makes little or no effort to develop a schedule.
The student uses scale provided on map to calculate distances. **(Question 2)**	Student determines the total round trip distance for **each** school within a 10% margin of error. Student work is detailed and clear.	Student determines the total round trip distance for 7 or 8 schools within a 10% margin of error. Student work may lack some detail.	Student determines the total round trip distance for 5 or 6 schools within a 10% margin of error. Student work may lack some detail.	Student attempts to determine the total round trip distance for each school but has **more than 4 errors.**	Student makes little or no effort to determine the total round trip distance for each school.
The student calculates mean. (Question 3)	Student determines the **exact mean** based on the distances determined in 2) above. Student work is detailed and clear.	Student determines the mean, within **one mile**, based on the distances determined in 2) above. Student work may lack some detail.	Student determines the mean, **within ten miles**, based on the distances determined in 2) above **or** student accurately determines the mean but work is not shown.	Student attempts to determine the mean but answer is off by **more than ten miles.**	Student makes little or no effort to determine the mean.
The student develops a revised schedule that meets both old and new criteria and clearly communicates the process. **(Question 4)**	Student accurately revises the schedule so that it meets **all** criteria and is well organized. Explanation is detailed and clear. No errors are present.	Student accurately revises the schedule so that it is organized and meets **all** criteria, except that minor errors in number of home meets may be present. Explanation may lack detail.	Student revises the schedule and lowers the mean but has an intrusive error. Explanation may lack detail.	Student revises the schedule but does not lower the mean or has more than one intrusive error.	Student makes little or no effort to revise the schedule.

Comments _____

Score _____ Scorer's Initials _____

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0
The student develops a schedule that meets all criteria and clearly communicates the process. (Question 1)	Student accurately develops a schedule that meets **all** criteria and is well organized. Explanation is detailed and clear. No errors are present.	Student accurately develops a schedule that is organized and meets **all** criteria, except that minor errors in number of home meets may be present. Explanation may lack detail.	Student develops a schedule that meets **some** criteria but contains an intrusive error. Explanation may lack detail.	Student develops a schedule that contains more than one intrusive error.	Student makes little or no effort to develop a schedule.
The student uses scale provided on map to calculate distances. (Question 2)	Student determines the total round trip distance for **each** school within a 10% margin of error. Student work is detailed and clear.	Student determines the total round trip distance for 7 or 8 schools within a 10% margin of error. Student work may lack some detail.	Student determines the total round trip distance for 5 or 6 schools within a 10% margin of error. Student work may lack some detail.	Student attempts to determine the total round trip distance for each school but has **more than 4 errors.**	Student makes little or no effort to determine the total round trip distance for each school.
The student calculates mean. (Question 3)	Student determines the **exact mean** based on the distances determined in 2) above. Student work is detailed and clear.	Student determines the mean, within **one mile**, based on the distances determined in 2) above. Student work may lack some detail.	Student determines the mean, **within ten miles**, based on the distances determined in 2) above **or** student accurately determines the mean but work is not shown.	Student attempts to determine the mean but answer is off by **more than ten miles.**	Student makes little or no effort to determine the mean.
The student develops a revised schedule that meets both old and new criteria and clearly communicates the process. (Question 4)	Student accurately revises the schedule so that it meets **all** criteria and is well organized. Explanation is detailed and clear. No errors are present.	Student accurately revises the schedule so that it is organized and meets **all** criteria, except that minor errors in number of home meets may be present. Explanation may lack detail.	Student revises the schedule and lowers the mean but has an intrusive error. Explanation may lack detail.	Student revises the schedule but does not lower the mean or has more than one intrusive error.	Student makes little or no effort to revise the schedule.

Comments _____

Score _____ Scorer's Initials _____

Certificate of Initial Mastery

2004-05 School Year

HIGH SCHOOL MATHEMATICS
EXTENDED TASK #6

A Park Proposal

SCORE:	

Central Falls
Coventry
Johnston
Lincoln
Middletown
Pawtucket
West Warwick
Warwick

MATHEMATICS

EXTENDED TASK #6

2004-2005

A PARK PROPOSAL

Please PRINT the information in the spaces below. When you are done, please use the sticker provided and attach this page to the cover page.

First Name:																	
Last Name:																	

Class				

Year: | | | |

School:																	
Teacher:																	

	Month			Day			Year	
Date:			**/**			**/**		

Copyright © 2004 Rhode Island Skills Commission. Do not copy or distribute without permission. Do not use for commercial purposes.

Standards and Indicators Assessed

M1f   Number and Operation Concepts
♦   Compares numbers using order relations, differences, ratios, proportions, percents, and proportional change.

M1h
♦   Understands dimensionless numbers, such as proportions, percents, and multiplicative factors, as well as numbers with specific units of measure, such as numbers with length, time, and rate units.

M6e   Mathematical Skills and Tools
♦   Makes and uses rough sketches, schematic diagrams, or precise scale diagrams to enhance a solution.

M6j
♦   Uses technology to create graphs or spreadsheets that contribute to the understanding of a problem.

M7h   Mathematical Communication
♦   Writes succinct accounts of the mathematical results obtained in a mathematical problem or extended project, with diagrams, graphs, tables, and formulas integrated into the text.

M8c   Putting Mathematics to Work
Design of a physical structure, in which the student:
♦   Creates a design for a physical structure;
♦   Uses general mathematical ideas and techniques to discuss specifications for building the structure;
♦   Prepares a report that explains the purpose of the project, the organizational plan, and conclusions, and uses an appropriate balance of different ways of presenting information.

A2b   Communication Tools and Techniques
The student prepares a formal written proposal or report to an organization beyond the school; that is, the student:
♦   Organizes the information in the proposal or report in a logical way appropriate to its purpose;
♦   Produces the proposal or report in a format similar to that used in professionally produced documents for a similar purpose and audience.

M1f   **Number and Operation Concepts**
♦ Compares numbers using order relations, differences, ratios, proportions, percents, and proportional change.

M1h
♦ Understands dimensionless numbers, such as proportions, percents, and multiplicative factors, as well as numbers with specific units of measure, such as numbers with length, time, and rate units.

M6e   **Mathematical Skills and Tools**
♦ Makes and uses rough sketches, schematic diagrams, or precise scale diagrams to enhance a solution.

M6j
♦ Uses technology to create graphs or spreadsheets that contribute to the understanding of a problem.

M7h   **Mathematical Communication**
♦ Writes succinct accounts of the mathematical results obtained in a mathematical problem or extended project, with diagrams, graphs, tables, and formulas integrated into the text.

M8c   **Putting Mathematics to Work**
Design of a physical structure, in which the student:
• Creates a design for a physical structure;
• Uses general mathematical ideas and techniques to discuss specifications for building the structure;
• Prepares a report that explains the purpose of the project, the organizational plan, and conclusions, and uses an appropriate balance of different ways of presenting information.

A2b   **Communication Tools and Techniques**
The student prepares a formal written proposal or report to an organization beyond the school; that is, the student:
♦ Organizes the information in the proposal or report in a logical way appropriate to its purpose;
♦ Produces the proposal or report in a format similar to that used in professionally produced documents for a similar purpose and audience.

M(G&M) 10-7 Geometry and Measurement
♦ Uses units of measures appropriately and makes conversions within or across systems.

M(G&M) 10-5 Geometry and Measurement
♦ Applies concepts of similarity by determining the impact of scale on the area of two-dimensional figures when solving problems involving missing lengths and using appropriate technology.

Student and Teacher Directions

Prerequisites:

In order to do this task, a student must be able to:
♦ Have basic understanding of ratio, proportions, scale in their non-routine applications
♦ Use formulas for perimeter and area for many types of figures
♦ Create a spreadsheet
♦ Create a scale drawing
♦ Produce a proposal

Teachers:
♦ ***Prior to giving the task, students should fill out the header sheet. Teachers should review the Standards, the Student and Teacher Directions, the Rubric, and the Prompt for clarity with the students.***
♦ ***This task should be given to students to work on for two full weeks.***
♦ Use of mathematical tools including calculators, graphing calculators, computers, textbooks and notes is permitted.
♦ Students must work alone on the task.
♦ The teachers should conference with each student within a week to make suggestions for revision. Then, the revised task should be submitted on time for scoring.
♦ Modifications according to Individual Educational Plans, 504 Plans and/or Personal Literacy Plans (PLPs) need to be in place.

Students:
♦ Read through the problem and the rubric once to determine what is being asked of you before you attempt to answer any part. Reread as needed.
♦ Revise your work after consulting with mathematics and English Language Arts teachers, and then submit project for scoring on time.
♦ Remember to supply supporting evidence in each part.
♦ Make sure you answer each question and include all requirements.
♦ The task name and test booklet number should be included on any additional pages.
♦ The final copy **must** be handed in hard copy form only. A disk will **not** be accepted.

If you use a calculator, you must thoroughly explain your reasoning and justify your solutions through calculations and/or written commentary. For example: using a calculator to divide 1296 by 48, you should write out 1296 / 48 = 27.

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0
Student collects appropriate information to create the proper design of a park (Question 1)	Student has collected proper materials to create a park proposal that meets **all criteria** of the Town Council. All resources have been identified.	Student has collected proper materials to create a park proposal. **Most** of the criteria have been met and resources have been identified.	Student has collected some material to create a park proposal. Some of the criteria has been met, but resources have not been identified. Some errors in calculation are evident.	Student has demonstrated some understanding of the given concepts. Errors in calculations are intrusive and adversely affect the final outcome.	Student has demonstrated little or no understanding of collecting information for a park proposal.
Student makes a precise scale diagram to display a possible solution to a given problem. (Question 2)	Student's scale diagram is exact and thorough, labeling all parts. Key is included and correct. Diagram is creative and aesthetically pleasing.	Student's scale diagram is complete although minor errors may not affect final outcome. Key is included and correct. Diagram is neat and aesthetically pleasing.	Student's scale diagram is complete although errors in scale adversely affect final outcome. Key is included but may be incorrect. Diagram needs to be developed further.	Student's scale diagram is incomplete or incorrect. Key is not included or is incorrect. Diagram is sloppy and shows a lack of effort.	Student's scale diagram shows little or no effort to display their proposal.
Student creates a detailed spreadsheet to show the purchased items for the park proposal. (Question 3)	Student's spreadsheet includes all items for the park proposal including number items, unit costs, total costs of each item, and total cost.	Student's spreadsheet includes **most** items for the park proposal including number of items, unit costs, total costs of each item and total cost.	Student's spreadsheet includes **some** items for the park proposal and **most** of the cost requirements	Student's spreadsheet includes some items for the park proposal but intrusive errors do not meet the criteria of the prompt.	Student's spreadsheet is incomplete displaying little effort.
Student prepares a formal written proposal to an organization beyond the school. (Question 4)	Student's proposal is persuasive and thorough. It effectively states why the design is the right choice. It is complete with cover page, description, scaled diagram, spreadsheet and summary.	Student's proposal is complete with cover page description, scaled diagram, spreadsheet and summary.	Student's proposal contains scaled diagram, spreadsheet, and summary that may be weak or incomplete. Proposal is disorganized or incomplete.	Student's proposal is disorganized and incomplete making it difficult to follow.	Student's proposal is incomplete showing very little effort.

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0

A Park Proposal
Extended Task #6

I   The Situation

There is a 500,000 square foot parcel of land located in front of your local ALLmart Store. The Manager has agreed to donate 200,000 square feet of cleared and flat land for the creation of a small park. The Town Council has designated $100,000 **for materials** for the development of the park and has asked members of the community to submit proposals for the design of the park. The park must contain the following:

- Formal seating (i.e. benches, picnic tables…) for at least 20 people
- An enclosed playground for 4-10 year old children
- Beautification landscaping
- Additional features that would benefit the community

II   Your Task

1. As a part of your park development, select a commercial playground system identifying all parts and costs. **Identify the source of your data.**

2. Draw a scaled diagram of the park labeling all parts. Include all requirements designated by the Town Council.

3. Create a detailed spreadsheet to show the number of items, unit costs, total cost for each item, and total cost for **materials** for the park

4. Prepare a formal proposal to the Town Council for your design. Include**:**

- ♦ A cover page containing the Title, author, and date of the proposal,
- ♦ A description of the features of the park,
- ♦ The scaled diagram of the park,
- ♦ The spreadsheet of items and costs of all materials for the park.
- ♦ A summary of why your park design should be chosen.

Scorer One

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0
Student collects appropriate information to create the proper design of a park (Question 1)	Student has collected proper materials to create a park proposal that meets **all criteria** of the Town Council. All resources have been identified.	Student has collected proper materials to create a park proposal. **Most** of the criteria have been met and resources have been identified.	Student has collected some material to create a park proposal. Some of the criteria has been met, but resources have not been identified. Some errors in calculation are evident.	Student has demonstrated some understanding of the given concepts. Errors in calculations are intrusive and adversely affect the final outcome.	Student has demonstrated little or no understanding of collecting information for a park proposal.
Student makes a precise scale diagram to display a possible solution to a given problem. (Question 2)	Student's scale diagram is exact and thorough, labeling all parts. Key is included and correct. Diagram is creative and aesthetically pleasing.	Student's scale diagram is complete although minor errors may not affect final outcome. Key is included and correct. Diagram is neat and aesthetically pleasing.	Student's scale diagram is complete although errors in scale adversely affect final outcome. Key is included but may be incorrect. Diagram needs to be developed further.	Student's scale diagram is incomplete or incorrect. Key is not included or is incorrect. Diagram is sloppy and shows a lack of effort.	Student's scale diagram shows little or no effort to display their proposal.
Student creates a detailed spreadsheet to show the purchased items for the park proposal. (Question 3)	Student's spreadsheet includes all items for the park proposal including number items, unit costs, total costs of each item, and total cost.	Student's spreadsheet includes **most** items for the park proposal including number of items, unit costs, total costs of each item and total cost.	Student's spreadsheet includes **some** items for the park proposal and **most** of the cost requirements	Student's spreadsheet includes some items for the park proposal but intrusive errors do not meet the criteria of the prompt.	Student's spreadsheet is incomplete displaying little effort.
Student prepares a formal written proposal to an organization beyond the school. (Question 4)	Student's proposal is persuasive and thorough. It effectively states why the design is the right choice. It is complete with cover page, description, scaled diagram, spreadsheet and summary.	Student's proposal is complete with cover page description, scaled diagram, spreadsheet and summary.	Student's proposal contains scaled diagram, spreadsheet, and summary that may be weak or incomplete. Proposal is disorganized or incomplete.	Student's proposal is disorganized and incomplete making it difficult to follow.	Student's proposal is incomplete showing very little effort.

Comments:

_____

Score: _____   **Scorer's Initials:** _____

Scorer Two

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0
Student collects appropriate information to create the proper design of a park (Question 1)	Student has collected proper materials to create a park proposal that meets **all criteria** of the Town Council. All resources have been identified.	Student has collected proper materials to create a park proposal. **Most** of the criteria have been met and resources have been identified.	Student has collected some material to create a park proposal. Some of the criteria has been met, but resources have not been identified. Some errors in calculation are evident.	Student has demonstrated some understanding of the given concepts. Errors in calculations are intrusive and adversely affect the final outcome.	Student has demonstrated little or no understanding of collecting information for a park proposal.
Student makes a precise scale diagram to display a possible solution to a given problem. (Question 2)	Student's scale diagram is exact and thorough, labeling all parts. Key is included and correct. Diagram is creative and aesthetically pleasing.	Student's scale diagram is complete although minor errors may not affect final outcome. Key is included and correct. Diagram is neat and aesthetically pleasing.	Student's scale diagram is complete although errors in scale adversely affect final outcome. Key is included but may be incorrect. Diagram needs to be developed further.	Student's scale diagram is incomplete or incorrect. Key is not included or is incorrect. Diagram is sloppy and shows a lack of effort.	Student's scale diagram shows little or no effort to display their proposal.
Student creates a detailed spreadsheet to show the purchased items for the park proposal. (Question 3)	Student's spreadsheet includes all items for the park proposal including number items, unit costs, total costs of each item, and total cost.	Student's spreadsheet includes **most** items for the park proposal including number of items, unit costs, total costs of each item and total cost.	Student's spreadsheet includes **some** items for the park proposal and **most** of the cost requirements	Student's spreadsheet includes some items for the park proposal but intrusive errors do not meet the criteria of the prompt.	Student's spreadsheet is incomplete displaying little effort.
Student prepares a formal written proposal to an organization beyond the school. (Question 4)	Student's proposal is persuasive and thorough. It effectively states why the design is the right choice. It is complete with cover page, description, scaled diagram, spreadsheet and summary.	Student's proposal is complete with cover page description, scaled diagram, spreadsheet and summary.	Student's proposal contains scaled diagram, spreadsheet, and summary that may be weak or incomplete. Proposal is disorganized or incomplete.	Student's proposal is disorganized and incomplete making it difficult to follow.	Student's proposal is incomplete showing very little effort.

Comments: _____

Score: _____ **Scorer Initials:** _____

For Official Use Only: ☐ GM _____ ☐ 3S _____

Certificate of Initial Mastery

2004-05 School Year

Mathematics
On-Demand Task #3C

Polygon Junction

RHODE ISLAND Skills Commission

Central Falls
Coventry
Johnston
Lincoln
Middletown
Pawtucket
West Warwick
Warwick

Name: _____

Date: _____

School: _____

Teacher: _____

MATHEMATICS

ON-DEMAND TASK #3C

POLYGON JUNCTION

2004-2005

Please PRINT the information in the spaces below. When you are done, please use the sticker provided and attach this page to the cover page.

First Name:																	
Last Name:																	

Class Year:				

School:														
Teacher:														

	Month		Day		Year
Today's Date:		/		/	

Standards and Indicators Assessed

M3i Function and Algebra Concepts
♦ Represents functional relationships in formulas, tables, and graphs, and translates between pairs of these.

M6h Mathematical Skills and Tools
♦ Sets up and solves systems of equations symbolically (when possible) and graphically.

M3c Function and Algebra Concepts
♦ Utilizes the concepts of slope when working with functions.

M2b Geometry and Measurement Concepts
♦ Works with 2-dimensiional figures and their properties, including polygons.

M7d Mathematical Communication
♦ Communicates logical arguments clearly, showing why a result makes sense and why reason is valid.

Standards and Indicators	Grade Span Expectations
M3i: ♦ Represents functional relationships in formulas, tables, and graphs, and translates between pairs of these. (Question 1)	
M6h: ♦ Sets up and solves (systems of) equations symbolically (when possible) and graphically. (Question 2)	**M(F&A)-10-4** ♦ Demonstrates conceptual understanding of equality by solving (symbolically and graphically) multi-step linear equations.
M3c: ♦ Utilizes the concepts of slope in working with Functions. (Question 2)	**M(G&M)-10-8** ♦ Demonstrates understanding of spatial relationships using location and position by solving problems on the coordinate plane involving, perpendicular and parallel lines, and slope.
M2b: ♦ Works with 2-dimensional figures and their properties, including polygons.	**M(G&M)-10-2** ♦ Uses the attributes, geometric properties, or theorems involving angles, lines, and polygons to justify solutions to problems using geometric properties, attributes, theorems, and postulates.
M7d: ♦ Communicates logical arguments clearly, showing why a result makes sense and why the reason is valid.	

Student and Teacher Directions

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/no Evidence 0
Student represents functional relationships in graphs. (Question 1)	Student **correctly** writes the equations of all **4** lines **and** includes all supporting work (in words or mathematics).	Student writes the equations of 4 lines with all supporting work, 3 of which are correct, **or** writes the equations of all 4 lines correctly with most supporting work.	Student writes the equations of 4 lines with supporting work, 2 of which are correct **or** writes the equations of 3 equations correctly with some supporting work, **or** writes the equations of all 4 lines correctly with little, or no supporting work.	Student has intrusive errors in at least **3** equations **or** does not write equations for all 4 lines.	Student shows very little understanding of the mathematics involved in writing equations.
Student solves systems of equations symbolically and graphically. (Question 2a)	Student identifies and verifies algebraically all points of intersection correctly. All calculations are shown.	Student identifies and verifies algebraically all but 1 point of intersection correctly **or** contains minor calculation errors. All calculations are shown.	Student identifies and verifies algebraically all but 2 points of intersection correctly **or** contains minor calculation errors with some work missing.	Student attempts to identify points of intersection but work is unclear or incorrect **or** student gives correct points of intersection but does not verify work algebraically.	Student does not attempt to identify the points of intersection.
Student solves problems on the coordinate plane involving perpendicular and parallel lines, and slope. (Question 2b)	Student identifies all parallel and perpendicular lines. All mathematical evidence is shown.	Student identifies all parallel and perpendicular lines. Some mathematical evidence is shown.	Student identifies at least one set of parallel or perpendicular lines with mathematical evidence **or** student identifies all parallel and perpendicular lines without mathematical evidence.	Student identifies at least one set of parallel or perpendicular lines without mathematical evidence.	Student does not attempt to identify parallel or perpendicular lines.
Student describes characteristics and relationships of polygons. (Question 3)	Student identifies and explains **more than 3** characteristics or relationships of the polygons.	Student identifies and explains **3** characteristics or relationships of the polygons.	Student identifies and explains **2** characteristics or relationships of the polygons **or** student identifies **3** characteristics or relationships but explanation is unclear or incomplete.	Student identifies 1 characteristic or relationship with little or no explanation.	Student does not attempt to identify characteristics or relationships of the polygons.

Task Prompt

1. Refer to the coordinate graph. Write the equations of lines a, b, c, and d. You **must** explain your work fully in words, or mathematically. **Use of graphing calculator is not permitted.**

2a. For all graphed lines that intersect, find the point of intersection. **Using algebra,**
verify point(s) of intersection. Include **all** calculations.

2b. Using slope, identify any parallel or perpendicular lines. Justify your answer using mathematical evidence.

3. Describe **3 or more characteristics and/or relationships of the polygons** formed by the intersections of the 4 graphed lines. **Be careful not to use the axes as one of the sides of a polygon.** Write an explanation that includes all mathematical evidence of your findings. (**Note: To exceed standard, you must describe more than 3 characteristics and/or relationships**)

Expectations	Exceeds Standards 4	Meets Standards 3	Nearly Meets Standards 2	Below Standards 1	Little/No Evidence 0
Student represents functional relationships in graphs. (Question 1)	Student **correctly** writes the equations of all **4** lines **and** includes all supporting work (in words or mathematics).	Student writes the equations of 4 lines with all supporting work, 3 of which are correct, **or** writes the equations of all 4 lines correctly with most supporting work.	Student writes the equations of 4 lines with supporting work, 2 of which are correct **or** writes the equations of 3 equations correctly with some supporting work, **or** writes the equations of all 4 lines correctly with little, or no supporting work.	Student has intrusive errors in at least **3** equations **or** does not write equations for all 4 lines.	Student shows very little understanding of the mathematics involved in writing equations.
Student solves systems of equations symbolically and graphically. (Question 2a)	Student identifies and verifies algebraically all points of intersection correctly. All calculations are shown.	Student identifies and verifies algebraically all but 1 point of intersection correctly **or** contains minor calculation errors. All calculations are shown.	Student identifies and verifies algebraically all but 2 points of intersection correctly **or** contains minor calculation errors with some work missing.	Student attempts to identify points of intersection but work is unclear or incorrect **or** student gives correct points of intersection but does not verify work algebraically.	Student does not attempt to identify the points of intersection.
Student solves problems on the coordinate plane involving parallel and perpendicular lines, and slope. (Question 2b)	Student identifies all parallel and perpendicular lines. All mathematical evidence is shown.	Student identifies all parallel and perpendicular lines. Some mathematical evidence is shown.	Student identifies at least one set of parallel or perpendicular lines with mathematical evidence **or** student identifies all parallel and perpendicular lines without mathematical evidence.	Student identifies at least one set of parallel or perpendicular lines without mathematical evidence.	Student does not attempt to identify parallel or perpendicular lines.
Student describes characteristics and relationships of polygons. (Question 3)	Student identifies and explains **more than 3** characteristics or relationships of the polygons.	Student identifies and explains **3** characteristics or relationships of the polygons.	Student identifies and explains **2** characteristics or relationships of the polygons **or** student identifies **3** characteristics or relationships but explanation is unclear or incomplete.	Student identifies 1 characteristic or relationship with little or no explanation.	Student does not attempt to identify characteristics or relationships of the polygons.

Comments: _____

Score: _____   **Scorer's Initials:** _____

EXPECTATIONS AND STANDARDS	EXCEEDS STANDARD 4	MEETS STANDARD 3	NEARLY MEETS STANDARD 2	BELOW STANDARD 1	LITTLE/NO EVIDENCE 0
Student represents functional relationships in graphs. **(Question 1)**	Student **correctly** writes the equations of all **4** lines **and** includes all supporting work (in words or mathematics).	Student writes the equations of 4 lines with all supporting work, 3 of which are correct, **or** writes the equations of all 4 lines correctly with most supporting work.	Student writes the equations of 4 lines with supporting work, 2 of which are correct **or** writes the equations of 3 equations correctly with some supporting work, **or** writes the equations of all 4 lines correctly with little, or no supporting work.	Student has intrusive errors in at least **3** equations **or** does not write equations for all 4 lines.	Student shows very little understanding of the mathematics involved in writing equations.
Student solves systems of equations symbolically and graphically. **(Question 2a)**	Student identifies and verifies algebraically all points of intersection correctly. All calculations are shown.	Student identifies and verifies algebraically all but 1 point of intersection correctly **or** contains minor calculation errors. All calculations are shown.	Student identifies and verifies algebraically all but 2 points of intersection correctly **or** contains minor calculation errors with some work missing.	Student attempts to identify points of intersection but work is unclear or incorrect **or** student gives correct points of intersection but does not verify work algebraically.	Student does not attempt to identify the points of intersection.
Student solves problems on the coordinate plane involving perpendicular and parallel lines, and slope. **(Question 2b)**	Student identifies all parallel and perpendicular lines. All mathematical evidence is shown.	Student identifies all parallel and perpendicular lines. Some mathematical evidence is shown.	Student identifies at least one set of parallel or perpendicular lines with mathematical evidence **or** student identifies all parallel and perpendicular lines without mathematical evidence.	Student identifies at least one set of parallel or perpendicular lines without mathematical evidence.	Student does not attempt to identify parallel or perpendicular lines.

Student describes characteristics and relationships of polygons. **(Question 3)**	Student identifies and explains **more than 3** characteristics or relationships of the polygons.	Student identifies and explains **3** characteristics or relationships of the polygons.	Student identifies and explains **2** characteristics or relationships of the polygons **or** student identifies **3** characteristics or relationships but explanation is unclear or incomplete.	Student identifies 1 characteristic or relationship with little or no explanation.	Student does not attempt to identify characteristics or relationships of the polygons.

Comments: _____

Score: _____ Scorer's Initials: _____